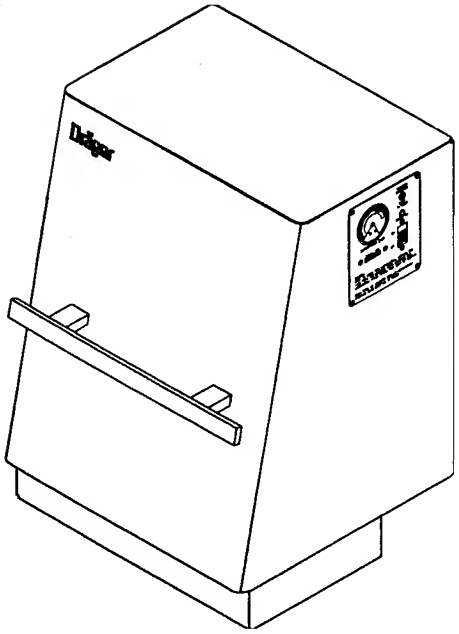

Dräger

MEDICAL AIR COMPRESSOR
OPERATION AND SERVICE MANUAL

SPECIFICATIONS:

Minimum Continuous Output: 60 lpm @ 37 psi
Outlet Pressure: 37-49 psi
Dew Point Depression: 3° C below room ambient
Power Requirement: 115V, 60Hz, 10 Amps
Current Leakage: normal polarity open ground less than 85 microamps
Circuit Breaker: 15 Amps
Weight: 126 lbs.
Noise Level: 52 dBa ± 2 dBa
Compressor Safety Valve: 85 psig ± 5 psig

*** PRECAUTIONS**

WARNING: Warnings alert the operator or users to situations that may cause serious injury if instructions are not followed.

CAUTION: Cautions alert the operator or users to situations that may cause equipment damage if instructions are not followed.

Before operating or servicing the air compressor, read and understand all the accompanying manuals. Be familiar with all the precautions, notes and warnings. Drager is not responsible for damages caused by misuse. Do not use the compressor if repair is needed. Replace broken or worn parts immediately. Follow the instructions in this service manual to perform scheduled maintenance and repairs.

WARNING: To avoid shock hazard, refer all servicing to qualified personnel.

WARNING: Do not use the compressor in the presence of flammable anesthetics.

WARNING: The compressor is grounded. DO NOT plug it into an ungrounded outlet or an adaptor.

WARNING: Never put oxygen into the compressor. The electrical components are not approved for oxygen use.

CAUTION: It is recommended that you install a transparent water trap at the inlet of all blenders, respirators, etc. to protect them from moisture in case the drying system of the compressed air source (portable or piped) fails. The water trap should be checked and emptied daily.

CAUTION: The compressor is of the oil-less type and MUST NOT be lubricated.

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ROUTINE MAINTENANCE

WARNING: Electrical shock hazard. Always turn off compressor and unplug it before servicing!

Note: After performing any maintenance procedure, verify the performance of the unit to the specifications on page 1, use an RT-200 or equivalent measuring device.

WEEKLY

Remove the foam inlet filter on the front of the compressor. Wash it in warm soapy water, rinse well, allow to dry and reinstall. Replacement part #13989.

QUARTERLY

Wash/replace the air pump intake filter elements:

1. Unthread the 8 screws from the rear door and remove door.
2. Locate the muffler in the left side of the compartment. Unscrew intake filter assy. from the muffler.
3. Snap the cap off of the intake filter and pull the filter elements out. Wash them in warm soapy water. Rinse well, allow to dry and reinstall. While the cap is off, wipe it and the inside of the filter with a clean dry cloth.
4. Reassemble by reversing steps 1 through 3.

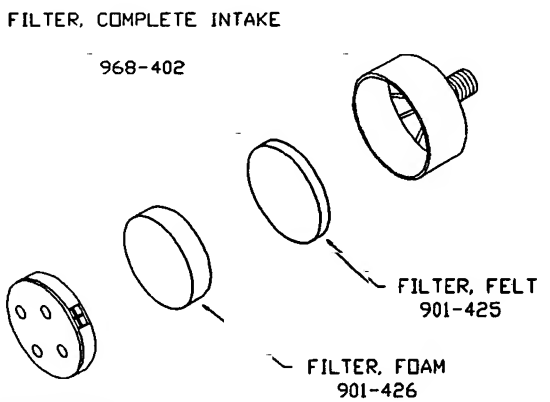

FIGURE 1

YEARLY

A Preventive Maintenance Kit should be installed, part #14003. It includes:

1. Inlet Filters (6)	#13989
2. Water Jar Filter	#924-401
3. Water Jar O-ring	#13530
4. Regulator Diaphragm	#923-402
5. Relief Valve Diaphragm	#923-401
6. Intake Filter Element	#901-425
7. Intake Filter Element	#901-426

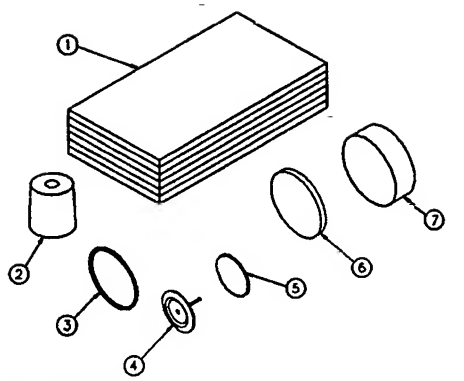

FIGURE 2

A. To install the intake filter element see 'QUARTERLY' page 2.

B. To install the water trap jar o-ring and water trap filter:

1. Remove the inlet filter from the front of the unit.
2. Loosen the 2 screws that hold the inlet grille in place and remove grille.
3. Pull the tubing off of the bottom of the water jar.
4. Unthread the bowl and remove.
5. Unthread the retainer cap and remove the filter.
6. Install the new filter and reinstall the retainer cap.
7. Carefully position the new O-ring on top of the water jar and rethread. It is important to make this seal tight.

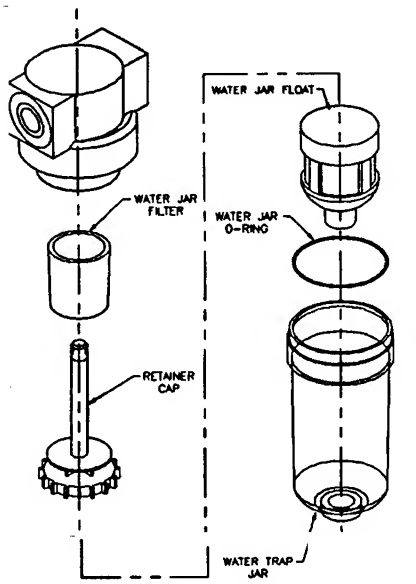

FIGURE 3

C. To install the relief valve and regulator diaphragms:

1. Unthread the 8 screws from the rear door and remove the door.
2. Relief valve has a white locking ring, regulator has a red locking ring.
3. Unthread and remove the bonnet portion of the relief valve.
4. Remove the worn diaphragm, install the replacement and reassemble relief valve.
5. Unthread the bonnet from the regulator.

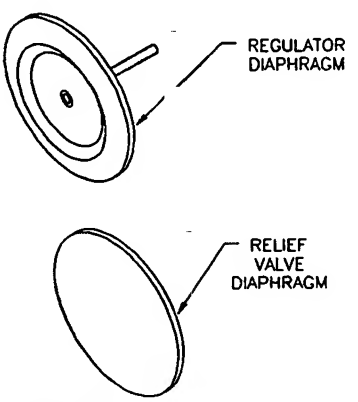

FIGURE 4

6. Remove the worn diaphragm, install the replacement and reassemble regulator.
7. Plug the compressor in, turn it on and allow it to warm up for 30 minutes.
8. TO RESYNCHRONIZE THE REGULATOR AND THE RELIEF VALVE:
   a. Pull out the lock ring on the regulator and turn the knob clockwise until it is completely closed.
   b. Attach a pressure gauge to the DISS fitting on the relief valve of the compressor.
   c. Pull out the locking ring on the relief valve and turn the knob until the pressure gauge reads 62 psi ± 1 psi. If the pressure is set below 62 psi, the efficiency of the drying system will be reduced.

CAUTION: Do not adjust pressure over 62 psi. This can cause damage to the pump.

   d. Once the relief valve is adjusted properly, push in the locking ring to lock in the new setting.
   e. Attach a pressure gauge to the outlet of the compressor. Adjust the regulator until the outlet pressure is approximately 46 psi ± 1 psi at a no flow condition.

NOTE: The one way valve in the outlet does not allow air flow to come back into the compressor. If you have to adjust the relief valve down, unthread the gauge enough to bleed the pressure off, then tighten the pressure gauge and check the pressure. You can save time by adjusting the valve all the way down, bleeding off the pressure and adjusting upwards. After each adjustment, allow a few seconds for the system to stabilize.

   f. Once the regulator is adjusted properly, push in the locking ring to lock in the new setting.
   g. Reinstall rear door using the 8 screws removed in C.1

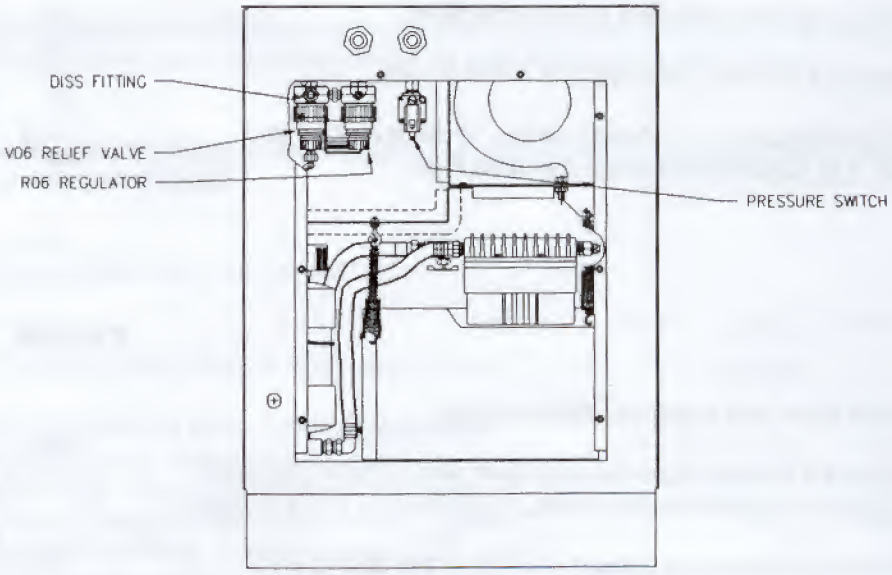

FIGURE 5

BETWEEN 8,000-9,000 HOURS
Install an air compressor overhaul kit #14876.

KEY PARTS LIST #14876

1. Connecting Rod W/Sleeve	14877
2. Exhaust Valve Flapper	14006
3. Intake Valve Flapper	14007
4. Sleeve O-ring	14008
5. Gasket O-ring	14009
6. Eccentric/bearing Assy.	14878

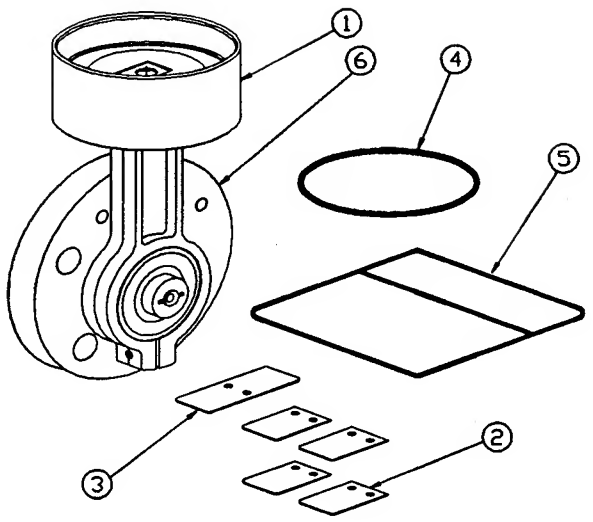

FIGURE 6

Removing the compressor from the cabinet:

WARNING: Unplug the power cord before proceeding to remove the compressor from the cabinet.

1. Unthread the 8 screws that attach the rear door of compressor. Remove the door.
2. Pull the clear tubing off of the fitting on the pump head.
3. Unplug the pump wires at the 5-pin connector.
4. Disconnect the 4 springs from pump at eyebolts and hanger.
5. Move pump out of the way so you can access the connection of the braided hose to the bulkhead assembly. Disconnect hose from fitting.

Install the Overhaul Kit #14876

1. Unthread the 6 screws and remove head.
2. Remove the valve plate assembly.
3. Remove the flapper screws and replace flappers. Place a drop of loctite #271 on flapper screws when reinstalling.
4. Unthread the fan screw. Remove the screw, washer and fan.
5. Using a long 5/32" (4mm) Allen wrench, loosen the cap screw on the lower end of the connecting rod assembly.
6. With a slotted screwdriver spread the bottom of the connecting rod. Pull the connecting rod off of the eccentric/bearing. The connecting rod can now be lifted out through the top of the housing.
7. Using a long 5/32" (4mm) Allen wrench, loosen the 2 set screws in the eccentric/bearing. The eccentric/bearing can be removed by twisting from side to side slightly.
8. Slide the new eccentric/ bearing onto the motor shaft so that the set screws in the eccentric/bearing line up with the flats on the shaft. Turn the set screws in against the shaft, then turn them back out just enough to allow the eccentric/bearing to slide in and out on the shaft.
9. Install the new connecting rod/sleeve assembly with sleeve O-ring and tighten the cap screw to 15 in-lbs (1.7 N-m).
10. Reinstall the valve plate, and head with a new O-ring gasket using six screws.
11. Reinstall the fan, putting the fan screw through the hole in the fan marked: 1007.
12. Turn the motor with the fan approx. 12 times to allow the eccentric to self-align on the shaft. Tighten the eccentric/bearing set screws to 80 in-lbs (9.0 N-m)
13. Reinstall compressor by following steps 1 to 5 on page 5 in reverse.

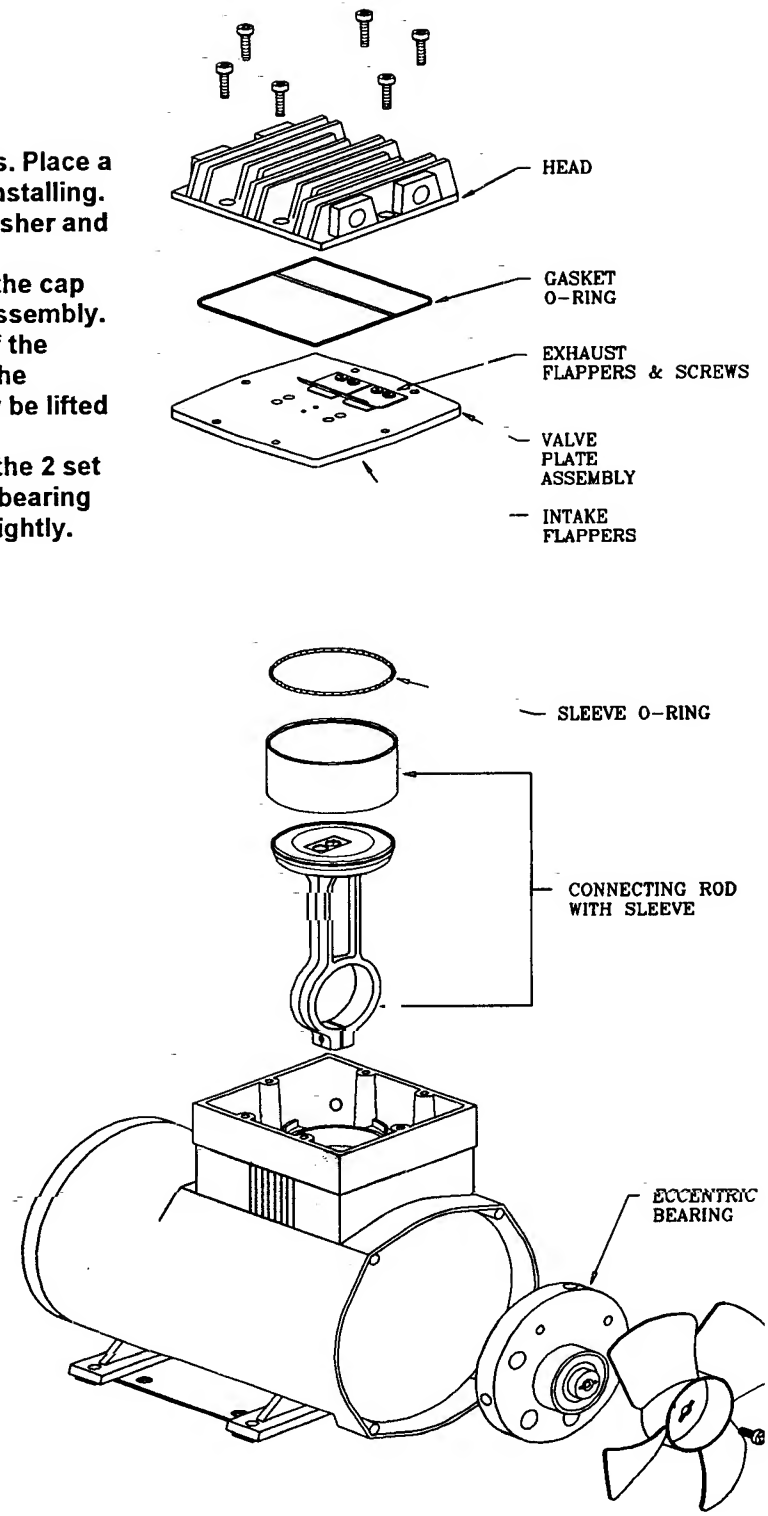

FIGURE 7

A. SYSTEM PERFORMANCE GAUGE NEEDLE, STICKING OR VIBRATING

Remove the 4 screws that secure the control panel, remove the control panel and locate the needle valve. Turning the needle valve clockwise will eliminate vibration. Counter clockwise rotation will correct sticking. A proper setting is important in preventing damage to the performance gauge.

B. OVERHEATING

1. The inlet filter is clogged and needs to be cleaned.
2. The unit is operating in a hot, unventilated area.
3. The inlet filter is blocked by curtains, bedding, etc.
4. The cooling fan is not working properly.
5. The cabinet air outlet is blocked.

C. NOISE/EXCESSIVE VIBRATION

1. The compressor is worn, making a loud clattering noise in the compressor chamber. It should be removed and inspected. SEE page 5, "BETWEEN 8,000-9,000 HOURS".
2. Hose to intake muffler is disconnected from the compressor.

D. WATER PROBLEMS (Water coming out of the air outlets)

1. The compressor has overheated. See OVERHEATING.
2. The regulator is out of synchronization. To resynchronize see YEARLY section C.8, page 4.
3. The automatic float in the water trap is malfunctioning. Check to see if the water jar is full of water. See section B of YEARLY, page 3 for access to the water jar.
4. Flowrate is exceeding compressor limits and pressure gauge needle is no longer in the green section.

E. HIGH PRESSURE

1. The regulator is set too high. See section C of YEARLY, page 3.
2. The regulator diaphragm needs to be cleaned or replaced. See section C.8 of YEARLY, page 4.

F. LOW PRESSURE

If the compressor motor is not running:

1. The power cord is unplugged.
2. The circuit breaker needs to be reset (push reset button on control panel). Wait 5-10 seconds then turn the compressor back on. If the unit continues to trip the circuit breaker, call your dealer or Drager.
3. The thermal overload protector in the compressor motor has activated. It will automatically reset within 20-30 minutes. If the power switch is left on, the fan will cool the motor faster. Activation of the thermal overload protector is caused by:
   a. Any of the causes listed in OVERHEATING page 7.
   b. A motor defect is causing it to draw too much power. This will quickly overheat the motor. Current levels should not exceed 10 amps during normal compressor usage.
4. The power from the wall outlet has been interrupted.
5. Low line voltage at wall outlet. Plug compressor into a separate electrical circuit.

If the compressor is running:

1. The outlet is leaking.
2. The water trap jar is improperly installed.
3. The O-ring on the water trap jar is improperly installed or missing.
4. An internal brass fitting is leaking.
5. The compressor's pop-off valve is defective. Replace the valve or readjust to 85 psi ± 5 psi:
   a. Loosen the lock nut on the pop-off valve with a 1/2" wrench.
   b. Adjust the end nut with a 7/16" wrench.
   c. Tighten the lock nut.
6. The regulator is set too low. See section C.8 of YEARLY, page 4.
7. The solenoid dump valve is leaking or stuck open. See section A of SERVICE.
8. The pressure gauge needle is stuck. See section A of TROUBLE SHOOTING.

SERVICE

WARNING: To avoid electrical shock, refer servicing to qualified service personnel. Always turn the unit off and unplug power cord when servicing.

A. TO CHECK FOR A FAULTY SOLENOID VALVE

1. Unplug the compressor from the wall outlet before servicing.
2. Remove the 8 screws that secure the rear door and remove door.
3. Locate solenoid valve, near lower left of cabinet.
4. Disconnect the hose from the solenoid valve outlet.
5. Attach a long piece of 1/4" tubing to fitting on the solenoid valve and run to the outside of the compressor.
6. Plug the power cord in and turn the compressor on.
7. Submerge other end of the 1/4" tube in water and check for bubbles to appear. If bubbles appear, the plunger inside the valve is probably dirty causing the valve to leak. Replace the solenoid valve.

B. ADJUSTING THE COMPRESSOR DISCONNECT PRESSURE SWITCH

WARNING: Turn off the power switch before adjusting the disconnect switch! Wires connected to the disconnect switch are attached to line voltage that can create a shock hazard if it is adjusted with the power switch "ON".

NOTE: The cut-in/cut-out deadband or differential pressure is not adjustable, it is factory preset. The typical differential pressure is 3.5 PSI with a maximum of 5.0 PSI.

1. Unplug the compressor from the wall outlet before servicing.
2. Remove the 8 screws that secure the rear door and remove door.
3. Locate the compressor disconnect switch in the upper left hand compartment of the compressor.
4. There is an adjustment screw on the disconnect switch above the terminal connections (see fig. 8). This screw adjusts both the cut-in and cut-out pressures. The cut-in pressure setting turns the compressor system on when the pressure attached to the "WALL" fitting falls below that setting. The cut-out pressure turns the compressor system off when the pressure attached to the "WALL" fitting rises above that setting. The difference between these two readings is the differential pressure.

5. Attach an air supply with a self-relieving regulator and pressure gauge to the air inlet fitting marked "WALL" on the back of the compressor. Turn the adjustment screw counter-clockwise two full turns and then adjust the supply pressure to 30.0 psi ± .5 psi.
Turn the adjustment screw clockwise until you hear the pressure switch click. Slowly turn the adjustment screw counter-clockwise until you hear the switch click again. The cut-in pressure is now set at 30.0 psi.

Note: Factory set Cut-in pressure is 30 psi ± 0.5 psi.

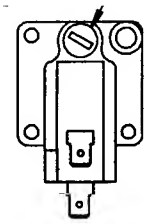

FIGURE 8

EXTERNAL AIR RESERVOIR KIT

A. AIR OUTLET MODIFICATIONS: (See figure 9)

1. Remove the air DISS fitting with check from the bulkhead fitting marked "OUT" on the cabinet.
2. Clean threads of the DISS fitting and apply teflon tape to the clean male threads
3. Clean all residue from the internal threads of the bulkhead fitting.
4. Clean threads of the tee assembly and apply teflon tape to the male threads
5. Install the air DISS fitting with check into the tee assembly.
6. Install this assembly into the bulkhead fitting that the air DISS fitting was removed from. The DISS fitting without check should point down when this assembly is in it's final position. This fitting connects by hose to the ventilator.

B. INSTALLING THE OPTIONAL EXTERNAL AIR RESERVOIR: (See figure 9)

1. Remove the (4) cord wraps that are attached to the door and reinstall them on the compressor cabinet beside the door.
2. Reinstall (8) screws into the mounting holes on the door.
3. Remove and retain the (4) screws that occupy the mounting holes for the reservoir brackets.
4. Install the reservoir and connector assembly to the door assembly using (2) of the flat head screws included with this kit.
5. Install the reservoir tie down strap to the door assembly using (2) of the flat head screws included with this kit.
6. Connect one end of the air hose included with this kit to the DISS fitting on the reservoir connector assembly. Connect the other end of this hose to the DISS fitting without check on the tee assembly.
7. Check all new connections for leaks.

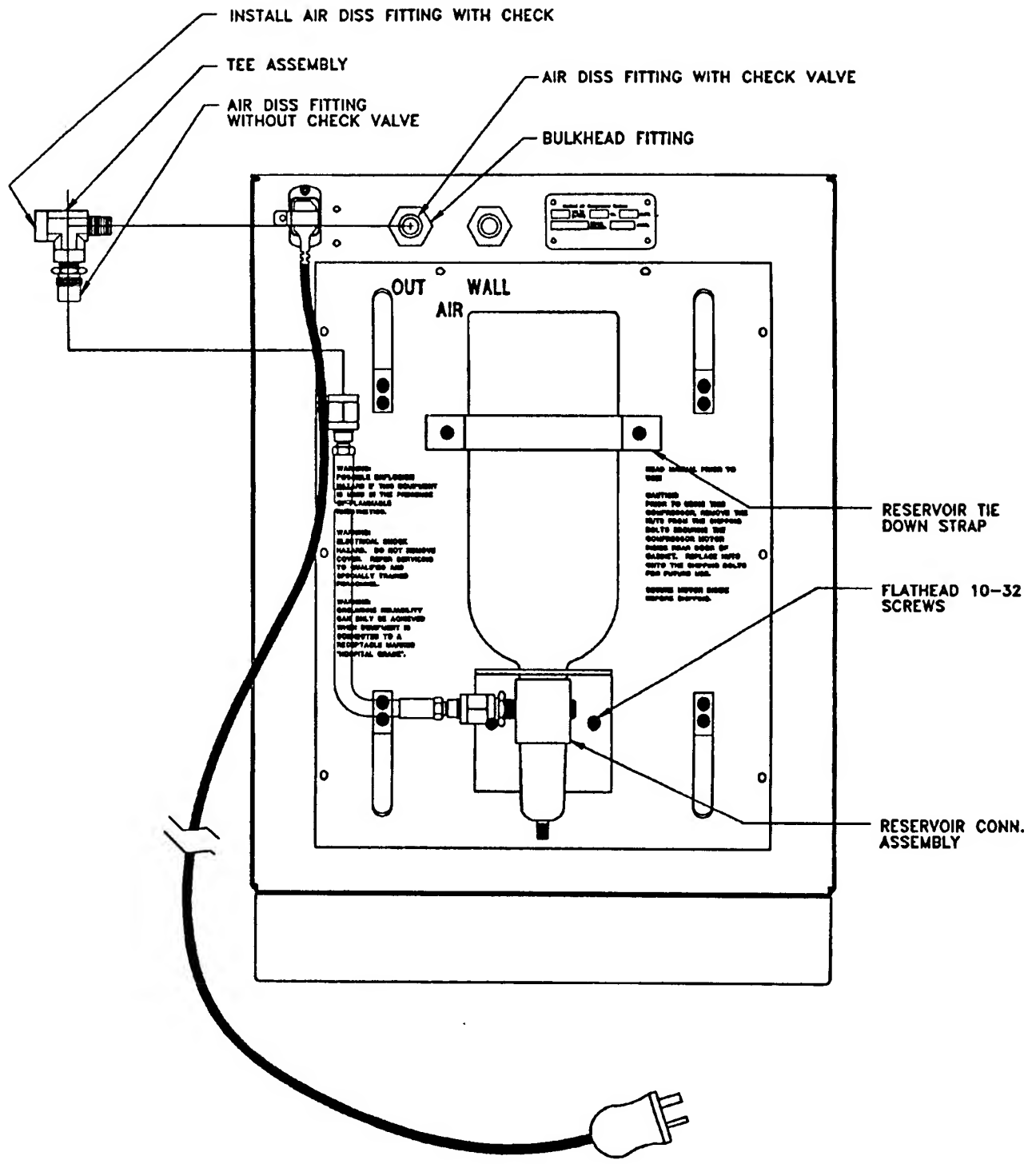
INSTALL AIR DISS FITTING WITH CHECK
TEE ASSEMBLY
AIR DISS FITTING WITHOUT CHECK VALVE
AIR DISS FITTING WITH CHECK VALVE
BULKHEAD FITTING
OUT WALL AIR
RESERVOIR TIE DOWN STRAP
FLATHEAD 10-32 SCREWS
RESERVOIR CONN. ASSEMBLY

Figure 9

REPLACEMENT PARTS LIST

PART #	DESCRIPTION
510-502	Power Switch
8134	Elapsed Time Indicator
11477	Indicator Light, Green
11530	Indicator Light, Red
8628	Current Sensing Relay
8629	Solenoid Valve
901-408	Water Jar Assy. Complete (FIG.3)
901-425	Felt Intake Filter Element (FIG.1)
901-426	Foam Intake Filter Element (FIG.1)
903-401	Relief Valve (FIG.5)
903-402	Regulator (FIG.5)
911-411	Water Jar Float Assy. (FIG.3)
923-401	Relief Valve Diaphragm (FIG.4)
923-402	Regulator Diaphragm (FIG.4)
924-401	Water Jar Filter (FIG.3)
968-402	Intake Filter, Complete (FIG.1)
990-434	Pop-off Valve
991-420	Water Jar w/bushing and nut (FIG.3)
13530	Water Jar O-ring (FIG.3)
13979	Cord Hook
14003	Preventive Maint. Kit (FIG.2)
14876	Pump Overhaul Kit (FIG.6)
14852	External Air Reservoir and Connector Assembly
14767	Compressor Assembly
S122-176-001-RPL	Compressor Disconnect Pressure Switch